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A review of the definitions and theories behind attention span deficits in learning disabled children and their effects on learning

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A REVIEW OF THE DEFINITIONS AND THEORIES BEHIND ATTENTION SPAN DEFICITS IN LEARNING DISABLED CHILDREN AND THEIR EFFECTS ON LEARNING

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DEDICATION

To my two children for their spirit, enthusiasm, understanding, and encouragement that helped me along the way.

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CHAPTER I

INTRODUCTION

In 1949 Strauss and Lehtinen described the brain damaged syndrome using such terms as distractibility, hyperactivity, perseveration, and disturbed perception. Distractibility was further described as the most characteristic of the brain injured child's difficulties.

> He finds it impossible to engage in any activity in a concentrated fashion but is always being led aside from the task at hand by stimuli that should remain extraneous but do not. In extreme cases, his activity may appear to be an aimless pursuit of stimulus after stimulus as one after another of the elements of his perceptual environment attracts his attention.[1]

Purpose of the Paper

Researchers dealing with attention span deficits have attempted to define attention through physiological and behavioral observations. For the purpose of this paper, this review concentrated on the various definitions conceived through behavioral observations of the meaning of the term attention as it pertained to learning disabled

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[1]A. A. Strauss and L. S. Lehtinen, Psychopathology and Education of the Brain-Injured Child (New York: Grune and Stratton, 1947), p. 135.

children. Theories explaining the deficits and the behavioral characteristics noted in the classroom were also investigated.

Scope and Limitations

It was not possible, due to the lack of agreement among researchers, to limit this paper to the use of a single definition for the term attention. Thus, this term was used to describe many different behaviors in children whose ages ranged from preschool through adolescence. The two major theories reviewed attributing a cause to attention span deficits were selected with a specific goal. This was to determine whether the causes could be shown to be due to a developmental lag which might eventually disappear or could be ascribed to neurological damage. If shown to be a neurological disorder, it would eliminate the possibility of the disappearance of this deficit with maturity. The effects or consequences caused by this deficit on learning disabled children's progress in school was also of interest.

Other theories concerned with genetic factors, birth trauma, pregnancy, environmental and food additives were not included here.

Definitions of Terms

The term learning disabilities was defined in P. L. 94-142 Section (5(b)(4) as follows:

> The term children with specific learning disabilities means those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write or spell or do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or environmental, cultural or economic disadvantage.[1]

Summary

This study was undertaken in an attempt to review and select a definition for the term attention as it pertains to the field of learning disabilities. No agreement could be found as to a single definition. The investigation of the causes of this deficit involved two theories in particular: the developmental lag theory and the theory of neurological disorder. The behavioral characteristics described in the classroom and its effects on learning were also reviewed. The ages considered included preschool through adolescence. A definition of the term learning disabilities was presented.

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[1] P. L. 42-142 Section 5(b)(4), 1975, cited by Samuel Kirk, Sr. Joanne Marie Kliebhan, Janet W. Lerner, Teaching Reading to Slow and Disabled Learners (Boston: Houghton-Mifflin Company, 1978), p. 9.

CHAPTER II

REVIEW OF LITERATURE

Many efforts have been made on the part of researchers to formulate a definitive explanation for the concept of attention. Currently there is as yet no agreement as to a single definition. In review of the studies dealing with attention, it was found that these various definitions reflected the differences in the researcher's theoretical positions. Thus, each definition included descriptions of multiple and varying behavioral characteristics. The researchers agreed, however, that attention was a difficult concept to measure but they were not in agreement on definite ways to measure it. The consensus appeared to be that although the inability to be precise invited confusion over what was meant by this abstract term, all assumed that attention was a prerequisite for any learning to take place.

In an attempt to explain attention, Mostofsky stated: "the use of attention--it is claimed--has been

inferred from and at the same time used to explain things as the funneling of sensory inputs and the initiation of specifiable responses."[1] He felt that it was a difficult concept to measure directly and could be done only by observing changes in performance. He stated, however, that it was an essential prerequisite for any learning to take place.

Ross, dealing with the definition of attention in his book, The Psychological Aspects of Learning Disabilities and Reading Disorders, quoted Hogan and Hale's description of attention, "the ability to attend selectively to the critical features of a stimulus and to ignore the irrelevant detail is an integral part of the learning process."[2]

What is meant by attending behavior is explained by Harris as:

> . . . the orientation of eyes and ears and hands toward a task relevant stimulus, remaining still during the presentation of the stimuli, giving correct responses to questions which indicate learning or perception of pertinent stimulus dimensions.[3]

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[1]D. I. Mostofsky, "The Semantics of Attention," in D. I. Mastofsky (ed.) Attention: Contemporary Theory and Analysis (New York: Appleton, Century, Crofts, 1970), p. 10.

[2]Alan O. Ross, Psychological Aspects of Learning Disabilities and Reading Disorders (New York: McGraw Hill, 1975), p. 35.

[3]L. P. Harris, "Attention and Learning Disordered Children: A Review of Theory and Remediation," Journal of Learning Disabilities 19 (February 1976):100.

Harris felt that if a child was able to remain still during a presentation of stimuli he would be able to make correct responses indicating that he was able to perceive the important stimuli correctly. Thus, attention may be composed of a number of different or independent components which would cause different effects on learning.[1]

Some educators tend to see attention as only a single characteristic. Instead, Keogh feels that "attention cannot be characterized by a single response but rather can be observed in various ways depending on the task and the demands of the task."[2] Keogh does not feel, however, that attention is made up of any one component but rather of several factors that most probably are not independent of each other.[3]

Berlyne sees people as dealing constantly with incoming stimuli. If a person is not adequately equipped to attend selectively to only a limited number of these impulses, behavioral chaos would result. Thus the inability to handle these stimuli adequately could be considered a handicap.

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[1] Ibid.

[2] Barbara K. Keogh, Judith Margolis, "Learn to Labor and Wait: Attentional Problems with Children with Learning Disorders," Journal of Learning Disabilities 9:276-278.

[3] Ibid.

Berlyne divided attention into three selective processes:

1. Selective attention, where the motor response is determined by the stimuli which direct themselves to certain receptors.
2. Abstraction, which is the focusing on the stimulus qualities which belong to the same stimulus and receiving this information through the same receptors.
3. Exploratory behavior which is described as physiochemical changes which increase the inflow of information and exclude certain stimuli.[1]

Hagen and Hale also described attention as being composed of several factors. These included alertness, stimulus selection, focusing and vigilance, i.e. the ability to maintain one's attention to a task. They felt that a short attention span was one of the major deficits of learning disabled children.[2]

Hewitt, in describing a developmental sequence of educational goals, felt that attention was the first goal to be developed and was fundamental to all learning. He defined attention as "the ability to focus on relevant areas in the environment."[3]

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[1]D. E. Berlyne, "Attention as a Problem in Behavior Theory," in D. I. Mastofsky (ed.) Attention: Contemporary Theory and Analysis, pp. 25-49.

[2]J. W. Hagen and G. H. Hale, "The Development of Attention in Children," in A. O. Pick (ed.) Minnesota Symposium on Child Psychology (Minneapolis, Minn.: University of Minnesota Press, 1973), pp. 117-140.

[3]F. M. Hewitt, "A Hierarchy of Educational Tasks for Children with Learning Disorders," Exceptional Children 31 (1964):207-214.

The term distractibility was used by Cruickshank et al. to explain the lack of attention in hyperactive children. Distractibility was described as meaning: "an inability of the patient to control his attention to stimuli which are immediately significant to his adjustment."[1]

Strauss and Lehtinen saw the problem of distractibility as being related to the problem of structuring. They felt that the brain injured individual did not possess a coordinated sequence of perceptions which normal individuals do. Therefore, the individual's responses tended to be isolated without being integrated into a larger pattern of stimuli.[2]

Causes and Behavioral Characteristics of Children with Attention Span Deficits

Several theories have developed and are still under investigation as to what causes attention span deficits. Many researchers have concentrated on two theories in particular: that of a developmental lag and the theory of neurological disorders. Some feel that it might be a

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[1]William Cruickshank, Frances Bentzen, Fredrick Ratzsburg and Marion Tannenhauser. A Teaching Method for Brain-injured and Hyperactive Children (New York: Syracuse University Press, 1961), pp. 4-6.

[2]Strauss and Lehtinen, Psychopathology and Education of the Brain-Injured Child, p. 135.

consequence of both together, where the neurological disorder causes the developmental lag.

Theories Pertaining to a Developmental Lag

The characteristics of attention span difficulties appear to involve various overt as well as unobservable reactions. These reactions are discussed and explained under several names.

In his descriptions of learning disabled children, Ross offered the possibility that an attention span disorder might be due to a developmental delay or maturational lag. Ross felt that many of these terms, such as distractibility, hyperactivity, and perseveration, are really the same as having a problem in selective attention. He argued "that the term 'learning disabilities' should be used only with those children who along with other problems were experiencing difficulty in sustaining attention."[1] If the theory of a developmental lag were to be confirmed, it should be assumed also that all children develop at different rates. If selective attention were to be considered a requirement for success in the classroom, these children would fail since, for them, this skill developed more slowly.

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[1]Alan O. Ross, Psychological Aspects of Learning Disabilities and Reading Disorders, pp. 11-61.

Attention for now can only be an inferred concept. To know whether a child or person is paying attention would be to require him to complete a task which could be accomplished only if he were paying attention.

Ames felt that identifying the children's stage of readiness for learning might cut down the number of failures and disabilities by as much as 50 percent. She believes that the outstanding cause of school difficulty can be found to be immaturity in these children. Attention span capabilities are included in her evaluation of children's behavioral levels in measuring readiness for school.[1] Considering the different rates of development is important and Ames explains why.

> Perhaps the majority of learning disabilities do not need to occur. The distinction between normal and abnormal learning potential may not be as great as is commonly believed. Children with learning disorders especially in reading difficulties may not actually be as different from children who do not as many teachers think. It may be more of a matter of timing than actual difference in potential. If pushed into an attempted performance before they are ready, children respond as best they can and their response is often a distortion of what would be the normal process.[2]

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[1]Louise B. Ames, "Learning Disabilities: The Developmental Point of View," Progress in Learning Disabilities Vol. II by Helmer R. Myklebust (New York: Grune and Stratton, 1968), pp. 37-39.

[2]Ibid.

Tarver, et al. also supports the theory of differing rates of development, hypothesizing that learning disabled children go through the same sequence of development toward maturity as other children but more slowly. From their studies, they found that increases in recall of information were related to age. They also found that learning disabled boys appeared to show a greater selective attention deficit than girls because of poorer recall.[1]

Gale and Lynn also observed that a capacity for sustaining attention increased with age. They found that girls appeared to give consistently higher performances than boys although these sex differences diminished with maturity. They felt that an earlier developmental rate for girls might be a possible explanation for these differences, forming the theory that attentional deficits may be due to biolgoical factors not dependent on intelligence but related developmentally to sex.[2]

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[1]Sara G. Tarver, Daniel P. Hallohan, "Attention Deficits in Children with Learning Disabilities: A Review," Journal of Special Education 7 (1974):560-569.

[2]A. Gale and R. Lynn, ""A Developmental Study of Attention," British Journal of Educational Psychology 42 (1972): 260-266.

While studying visual selective attention, Pick, Christy and Frankel found that younger children change their preferences more readily than older children. Older children appear more capable of excluding unimportant detail. They also are better able to use information for immediate recall. Thus, it appears that the ability to focus visual attention improved with age and may mean developmental changes in the ability to attend selectively.[1]

In a review of studies on hyperactive children, Douglas concluded that hyperactivity was only one of many critical symptoms of these children. Their inability to sustain attention and to keep impulsive responding behavior under control were even more important symptoms. She felt that activity levels should not be the only factor in describing their hyperactiveness. She concluded that because the child's attention span is short, he flits from one place to another. His behavior appears fragmented and disorganized and so he appears excessively active. Most of the children Douglas studied were male. They had a higher incidence of retention, failing grades by as much as two years by the time they were twelve years old. They achieved significantly lower marks in most academic areas

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[1]A. D. Pick, M. D. Christy and G. W. Frontel, "A Developmental Study of Visual Selective Attention," Journal of Experimental Child Psychology 14 (1972):165-175.

than normal children. Teacher observations dealt with problems of frustration, tolerance levels, concentration and the ability to organize one's activities. These children tended to receive lower I. Q. scores on group tests than on individual intelligence tests. While observing these children during task oriented behavior, Douglas found that their behavior was not aimless but rather differed from teacher goals. Younger hyperactive children talked more and moved more often in the classroom, attracting more attention from the teacher. Older children appeared less disruptive but their goals were still different more often than the classroom activity.[1]

Douglas feels evidence suggested that these children outgrow their symptoms supporting the theory of a maturational lag. Even young adolescents, however, continue to make more errors than normal children both visually and auditorially. In accounting for these deficiencies, Douglas concluded that these children apparently are unable to keep their impulses under control in situations where concentration and organization are required. They tend to react to the first idea that occurs to them or to those aspects of a situation which seem most obvious. This

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[1]Virginia Douglas, "Stop, Look, and Listen: The Problem of Sustained Attention and Impulse Control in Hyperactive and Normal Children, Canadian Journal of Behavioral Science 4 (1972):259-279.

appears to be true whether the task requires visual or auditory attention and appears also to be true on visual motor and kinesthetic tasks. These deficiencies influence their social behavior as well and they may find themselves in trouble with the law because of their lack of ability to control these impulses.[1]

Investigating the ability of children to mobilize and direct attention better with increasing age, Turnure found that by the age of six and one-half to seven and one-half years, children were able to make a significant change. His studies indicated that children at these ages could learn to control their attending responses while ignoring distracting stimuli. The timing of the development of this inner ability to direct attention coincided with the transition periods involving voluntary control of behavior observed by Luria and Piaget.[2]

Further support for the developmental theory comes from Hagen and Kail. The ages they pinpointed were different from Turnure's. They found that the ability to attend selectively and to ignore the irrelevant improved with age, with the major emphasis of this ability occurring

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[1] Ibid.

[2] James E. Turnure, "Children's Reactions to Distractors in a Learning Situation," Developmental Psychology 2 (1970):115-122.

around thirteen years of age. They believed it is possible to create situations that would facilitate and increase the child's ability to attend selectively and, thus, learn to discriminate better. However, this ability to discriminate better would develop at a slower rate than "normal children" because of these children's inability to attend continuously.[1]

Although Cohen, Weiss and Minde also found developmental improvement in the child's ability to attend, they did not feel that training in attention would continue to be effective over a prolonged period of time.[2]

Theories Pertaining to a Neurological Disorder

In their studies of attentional process of learning disabled children, Dykman, et al. found that these children made significantly more errors with slower timing during their tasks than normal children. They felt that the deficiencies were organically based. Neurological damage could explain the cause of these results, since the characteristics of a neurologically immature child include poor coordination with gross and fine motor tasks.

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[1]John W. Hagen and Robert Kail, Jr. Perceptual and Learning Disabilities in Children, Vol II (New York: Syracuse University Press, 1975), pp. 169-192.

[2]N. J. Cohen, G. Weiss, and K. Minde, "Cognitive Styles in Adolescents Previously Diagnosed as Hyperactive," Journal of Child Psychology and Psychiatry 13 (1972):203-209.

These areas require attention to be successfully completed. Neurological examinations revealed that older children, of eleven or twelve years, had fewer neurological problems than younger ones, suggesting a developmental process and supporting the theory that learning disabled children outgrow some of their hyperactivity.[1]

While investigating cerebral palsied children, Cruickshank and Hallohan concluded that these children definitely diagnosed as brain injured manifested distractibility problems in the tactile and visual areas. They claimed attention was an important variable in academic learning and was important also for scoring higher on I.Q. tests which are a strong indicator of the child's success in the classroom.[2] Cruickshank feels that distractibility is the chief characteristic of children with central nervous system

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[1]R. A. Dykman, et al., "Specific Learning Disabilities: An Attentional Deficit Syndrome," in Progress in Learning Disabilities by Helmer Myklebust Vol II (New York: Grune and Stratton, 1971), pp. 56-93.

[2]W. Cruickshank and Daniel Hallohan, Psychoeducational Foundations of Learning Disabilities (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1973), pp. 217-250.

disorders. His diagnostic data revealed also developmental lags in these children in the areas of walking, sitting, crawling, standing, and in speech and language development.[1]

Rourke and Czudner, studying brain damaged children, tried to determine if with increasing age these brain damaged children learned to become more attentive. Their studies found that over a period of time, this was true. Those considered young normals, older normals and older brain damaged groups were superior in attending behaviors to that of the young brain damaged group. There was no significant difference found between the performance of the older normal and the older brain damaged groups in attending behaviors.[2]

There is evidence to indicate that brain dysfunction, such as hyperactivity and poor test performances, attenuate with age.

Outgrowing a certain amount of hyperactivity suggests to Tanis and Bryan "that the initial problem is one of a developmental immaturity or developmental lag rather than a permanent dysfunction."[3]

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[1]Cruickshank and others, A Teaching Method for Brain Injured and Hyperactive Children, pp. 4-6.

[2]B. P. Rourke and G. Czudner, "Age Differences in Auditory Reaction Time of Brain Damaged and Normal Children Under Regular and Irregular Preparatory Interval Conditions," Journal of Experimental Child Psychology 14 (1972):372-378.

[3]Bryan Tanis and James Bryan, Understanding Learning Disabilities (Alfred Publishing Co., Inc. 1975), p. 86.

Hallahan et al. discuss the development of the child's ability to attend more selectively in dealing with cerebral palsey children. They found that these children's neurological damage did not make them different from normal children in their ability to attend selectively. They concluded that brain damage, particularly in spastic cerebral palsey children, was not a factor that influenced poor performance. They suggested considering the child's mental age as a basis for determining his selective attention ability rather than the chronological age.[1]

Differences in the quality of problem solving among children of the same age were studied by Kagen. He found that the tendency to be reflective or impulsive became stable over a period of time. Children appeared to have a general tendency to be impulsive or reflective in situations where they had to consider the validity of their answers. Impulsive children did not pause to consider the accuracy of their answers. Threat of failure caused them to worry over the quality of their performance and produced poorer recall. "Brain damaged" children were more likely

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[1]Daniel Hallahan, S. Stainback, W. Ball, James Kaufman, "Selective Attention in Cerebral Palsied and Normal Children," Journal of Abnormal Child Psychology 13 (1973): 280-291.

to be impulsive and their poorer intellectual performances were more the result of impulsivity than inadequate intellect. Kagen suggested training these children to become more reflective to aid them in their future performances.[1]

In discussing the question of the I.Q. scores of hyperactive children Wunderlick states that although the actual I.Q. may be normal, from third grade on, measurable I.Q. decreases because overactivity on the child's part makes it difficult for intellectual growth to occur. Neurological damage is linked to the cause of the rapid attention shift, poor listening skills and overactivity in these children. Overactivity causes the child to be out of his seat at school significantly more often than others which labels the child as a nuisance. Bad behavior causes him to become unpopular with his peers. Wunderlick feels it has been shown that hyperactivity lessens with the onset of puberty.[2]

Cantwell in his book on the hyperactive child explains a theory by Paul Wender of hyperactive children. Wender believes that increased activity and decreased

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[1]J. Kagen, "Reflection--Impulsivity: The Generality and Dynamics of Conceptual Tempo," Journal of Abnormal Psychology 7 (1966):17-24.

[2]Ray Wunderlick, "Hyperkinetic Disabled," Academic Therapy 15 (1969-1970):99-108.

ability to sustain or focus attention is due to a "minimal brain dysfunction," a term Wender prefers in describing the behavioral syndrome because it does not pinpoint the etiology of the syndrome. He believes that methods are not yet accurate enough to pinpoint and measure the cause of the syndrome as an actual quantifiable amount of brain dysfunction.[1]

The aspects of "minimal brain dysfunction" are discussed by Gesell and Amatruda. The behavior which they believe are the classical reactions of this dysfunction are: "attention, hyperactivity and emotional instability."

> Attention is one aspect of the integration and organization of behavior. When integration is impaired, attention will become as fleeting distractible or alternatively as perseverative and fixated.[2]

The child's movements in dealing with his environment become haphazard and disorganized or can be perseverative. These symptoms usually appear along with "motor sensory, intellectual or convulsive manifestations."[3]

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[1]Dennis Cantwell, quoting Wender, The Hyperactive Child (New York: Spectrum Publications, Inc., 1975), p. 10.

[2]Arnold Gesell and Catherine Amatruda, Gesell and Armatruda's Developmental Diagnosis: The Evolution and Management of Normal and Abnormal Neuropsychological Development in Infancy and Early Childhood (Maryland: Harper and Row, 1974), p. 239.

[3]Ibid.

In a review of literature, Keogh lists six characteristics most often mentioned by professionals and parents in describing hyperactivity symptoms: (1) restlessness; (2) hard to manage; (3) inattentiveness; (4) inability to sit still; (5) easily distractible; and (6) low frustration level.[1]

One of her three hypotheses explaining the distractibility factor in children deals with the possibility of neurological impairment. However, she makes no definitive conclusions and feels that this hypothesis would not be true for all hyperactives.[2]

It is not yet clear whether hyperactivity is due to a neurological disorder or to a maturational lag according to Dorothy Ross. It is not really of value to the parents in particular as to which it is. Hyperactivity, she feels, is more difficult to diagnose in preschool children. The doctor has to rely on the mother's discriptions of the child rather than reports from teachers who are better able to judge from a more structured setting. Ross found that teachers' complaints of these children dealt with the child's inability to stay seated

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[1]B. K. Keogh, "Hyperactivity and Learning Disorders: Review and Speculation," Exceptional Child 38 (1971):100-107.

[2]B. K. Keogh, "Hyperactivity and Learning Problems--Implications for Teachers," Academic Therapy 7 (1971): 47-50.

long enough to finish his work. The child's impulsivity caused him to make more errors with both written and oral work, yet he did not appear concerned over his mistakes. Teachers become unhappy with this behavior and transmit their attitudes to the peer group. They in turn make fun of the child if he blurts out incorrect answers. School becomes an unhappy experience for him and his self esteem usually suffers. This causes performance to worsen. Because behavior and academic performance are erratic and unpredictable, grades fluctuate also between highs and lows, causing the teacher to feel that if the child did well once, he can certainly do well again. Teacher attitudes then become less tolerant of this type of child.[1]

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[1]Dorothy M. Ross, Sheila A. Ross, Hyperactivity: Research, Theory and Action (New York: John Wiley and Sons, 1975), pp. 23-61.

CHAPTER III

SUMMARY AND CONCLUSIONS

Summary

Currently there is no definitive agreement in defining the term attention. Many definitions have been offered by each researcher who has attempted to devise an explanation in this deficit in learning disabled children. The lack of agreement over an exact definition offers the possibility of confusion to result in this area. Researchers agree, however, that attention is an inferred reaction that is inferred by observing identifiable changes in the behavior. By the same token, its non-existence can be observed by a lack of response. It appears that attention does not consist solely of one factor but instead is made up of several factors which are integrated with each other.

The cluster of characteristics that the lack of attention produces in children has been identified by various names such as: minimal brain dysfunction; hyperactivity; perseveration; brain damage; distractibility, etc. Although there are other causes under investigation still exploring the reason for this deficit, two of the major theories attribute its existence either to a developmental lag or to a neurological disorder, or perhaps a consequence of both.

Those subscribing to a maturational lag theory feel that the child's development in all areas towards maturity is slower than most children. Others believe that neurological disorders are the cause of certain behavioral characteristics. Still others feel that a neurological disturbance may produce a developmental lag that, with time and maturity, may eventually cause the behavioral characteristics to appear.

Many different kinds of characteristics attributable to this syndrome have been discussed by researchers and educators alike.

1. It is theorized that this deficit may be sex related. Boys appear to be identified with this deficit at a higher rate than girls.

2. In clinical observations, problems of attention are a major factor in the underachievement of these children in school. Because these children are impulsive, they respond too quickly, giving isolated responses in situations where the total picture has not been considered. Thus, school performance is usually poor. Their quick decision making results in many careless errors. Because their grades are erratic, from higher to lower, the teacher is convinced that they really can do better if they only "tried harder."

3. This quick responding behavior may be disruptive to the classroom. The peer group will often take the cue from the teacher's attitude and begin to make fun of of these children and thus isolate them socially in doing so. This

situation can produce antisocial behavior on their part and may be a reason why they sometimes get in trouble with the law.

4. These children appear to wander aimlessly a great deal about the classroom to the teacher's irritation who complain about their inability to stay seated for any length of time. Thus, many of their tasks are not adequately finished, yet these children do not appear to be concerned. This produces further irritation on the part of the teacher.

5. Quick and careless decision making probably explains the reason for poor test performance also. These children generally score lower on many of the group and individual I. Q. tests.

6. Whether or not the theory of a developmental lag proves correct, it remains that all children have different developmental rates. These particular children appear to go through the same stages of development as others but at a slower rate.

7. It has been noted that with increasing age many of these behaviors seem to disappear or at least to attenuate. Older children seem better able to concentrate and are able to filter the essential from the non-essential thus making fewer errors.

8. Although some have suggested various remediation techniques, it is doubtful to others that this deficit is trainable or that training would continue to have lasting effects.

Conclusions

It appeared to this writer that many characteristics of the hyperactive child or child with the short attention span were fairly well identifiable. Some of the same behaviors noted were mentioned over and over. However, it was noted that better ways to measure this deficit and general agreement on definite ways to measure it still need to be found. It was felt that the theory of a neurological disorder resulting in a developmental lag appeared to be a logical consideration. However, uncertainty still reigns over other etiological causes not investigated in this paper which need to be researched further before one can find a definite cause for this deficit. It is entirely possible that several factors are involved and no one answer will ever be found.

While research continues in the area of the etiology, it would be well to concentrate on possible teaching strategies that might alleviate the symptoms seen in the classroom. This implies further research as to whether training in this area will continue to show definite and lasting improvement. One encouraging fact is noted in that age and time appear to improve many of the behaviors noted. It appears frustrating yet has been felt as a warning note to educators that test results from these children cannot be relied on to present a clear picture of their capabilities. Academic tests have not been constructed with a sampling of handicapped learners.

It may be best for now to place most emphasis on informal observation until further testing is developed that will take into consideration these factors.

> Whether the hyperactivity these children display is no more than high but normal mobility, whether it is their reaction to repeated failure experiences, whether it is an aspect of their difficulty in sustaining selective attention, or whether it is in some or all cases indeed a reflection of neurological problems (minimal brain dysfunction) remain questions calling for research.[1]

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[1]Ross, Psychological Aspects of Learning Disabilities and Reading Disorders, p. 86.

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